

STATEMENT OF OBJECTIVES (SOO)

1.0 General Information

The Defense Energy Support Center (DESC), Defense Logistics Agency, as the Department of Defense (DOD) Integrated Materiel Manager (IMM) for Missile Fuels Products and related services, requires production and delivery of Gaseous Nitrogen (GN2), Type I, Grade A, as well as contractor-owned equipment, for Boeing North American, Santa Susana Facility, Canoga Park CA. The contractor shall install and maintain equipment to generate gaseous nitrogen by conversion of liquid nitrogen (LN2). The contractor shall provide all production and raw materials, transportation of LN2 to the GN2 plant, supplies, management, tools, equipment and labor necessary for the manufacture and delivery from the contractor's facility. Contract is FOB origin due to product being inspected and accepted at the conversion plant. The liquid nitrogen is transported by contractor-owned tankers directly to Boeing Santa Susana Facility. Boeing allows the contractor's drivers access 24 hours per day, seven days a week. Upon arrival the liquid nitrogen tankers are unescorted to the contractor-owned equipment site and the liquid nitrogen is offloaded into the contractor-owned storage tanks. The liquid nitrogen is then converted to gaseous nitrogen and transferred into Boeing's pipeline, where the GN2 is used in support of the development, manufacture and testing of rocket components and systems.

2.0 Government's Required Delivery Schedule

The contractor shall deliver all shipments on a 24 hour basis, 7 days a week. Delivery is FOB origin into the pipeline at Boeing North American – Santa Susana Facility. The contractor is responsible for all costs incurred prior to delivery into the pipeline. Product shall be delivered at 5,500 PSI nominal gauge pressure, ambient temperature.

The contractor's driver delivering the liquid nitrogen must have a valid driver's license and proof of U.S. citizenship.

3.0 Product Specification Requirements.

a. Offered product shall conform to the requirements of specification MIL-PRF-27401D, dated October 3, 1995, Propellant Pressurizing Agent, Nitrogen with the following modifications:

- (1) Paragraph 4.4.3, line 9: Replace "MIL-T-27730" with "A-A-58092,"
- (2) Figure 1: Replace "MS33584" with "SAE-AS4330."

b. REPORTS: In addition to the reports required in other clauses of this contract, one copy of a Certificate of Analysis shall be sent to DESC-BP/BQ for each sample taken in accordance with paragraph 4.2.7 of the specification. Analysis reports shall be in standardized format as outlined in the attachment entitled GUIDELINES FOR THE PREPARATION OF PRODUCT ANALYSIS REPORTS. The lab report shall be FAXed to (210) 925-8048 or mailed to the address shown below:

DESC-BP/BQ
Building 1621-K
2261 Hughes Ave., Suite 128
Lackland AFB TX 78236-9828

4.0 Contractor Equipment Requirement

a. The contractor shall install and maintain equipment necessary to generate gaseous nitrogen by conversion of liquid nitrogen, which meets the requirements of MIL-PRF-27401D, dated 03 Oct 1995, as modified above, at a maximum flow rate of 220,000 scf/hr. The equipment shall remain the property of the contractor and shall be removed within 60 days upon completion of the contract in full cooperation with the succeeding contractor so as to avoid the interruption of product supply. The contractor shall restore the premises to substantially the same condition prior to contractor's installation of equipment.

b. A land lease will be made available by Boeing to the contractor who receives the contract award.

5.0 PRODUCT REQUEST

a. Blanket Delivery Orders (DD Form 1155) will be issued by the DESC Contracting Officer IAW Clause I211 ORDERING. However, the DESC Inventory Manager is authorized to issue a Propellants Delivery Schedule which will designate the specifics as to individual deliveries to be accomplished under the Blanket Delivery Order. For purposes of this contract, a Delivery Propellants Schedule has the same force and effect as a delivery order.

b. A Propellants Delivery Schedule will be issued by the DESC Inventory Manager at **DEFENSE ENERGY SUPPORT CENTER, MISSILE FUELS COMMODITY BUSINESS UNIT OFFICE, DESC-MIC, 2261 HUGHES AVE., STE. 128, BLDG. 1621-K, LACKLAND AFB TX 78236-9828**. Propellants Delivery Schedule will normally be in writing, dated and serially numbered; however, oral request(s) may be made in an emergency as allowed by the Schedule, and will be confirmed in writing, within 24 hours. The Propellant Delivery Schedule will contain as a minimum:

- (1) Contract Line Item numbers(s) being scheduled.
- (2) Quantity of each item being scheduled. (Propellants Delivery Schedules are issued for single orders.)
- (3) Unit price and total price of each item being scheduled.
- (4) National Stock Number (NSN).
- (5) Contract and order number.
- (6) Destination of product.
- (7) Required delivery date(s).
- (8) Information in "Mark For" of Propellants Delivery Schedule must be included on the DD Form 250 in Block 14.
- (9) Remarks: Special Instructions to the contractor for processing the shipment and reason for amendments, if required.

c. The Contractor shall advise **DESC-MIC** and the using activity of the following:

- (1) List of personnel available on a 24-hour a day basis regarding shipments. The list shall include full name, office telephone number, home telephone number, direct distance dialing number, Fax number, and E-mail (if available) and kept updated with changes. All contractor employees must also have the name, title, mailing address, and phone number of the Government QAR.

(2) When shipment departs from the Contractor's plant, the Contractor shall provide the DESC Inventory Management Specialist and the customer, by telephone, email or fax within four (4) hours from time of departure (if fill plants(s) is within four (4) hours of destination, notification may be provided upon departure) the estimated quantity, estimated time of departure, the estimated date of arrival to the required customer facility, and shipping document number.

d. A Propellant Delivery Schedule will be considered terminated when a modification is signed by the DESC Contracting Officer.

6.0 SUBMISSION OF INVOICES FOR PAYMENT OF PRODUCT

a. Supporting documentation required for processing payment to the Contractor after delivery of product shall be the original DD Form 250 MATERIAL INSPECTION AND RECEIVING REPORT, or an original of its commercial equivalent along with an original invoice.

b. The contractor shall submit the original invoice on a monthly basis along with the original DD Form 250 or commercial equivalent, as described above, within fifteen calendar days of meter reading to:

Defense Finance and Accounting Service – Columbus Center
Attn: DFAS-BVDFB (Missile Fuels)
PO Box 182317
Columbus OH 43218-2317

c. In addition, the contractor shall concurrently mail two copies of the invoice, along with two copies of the DD Form 250 or commercial equivalent to:

DESC-MI (GN2 Inventory Management Specialist)
Building 1621 – K
2261 Hughes Avenue, Ste 128
Lackland AFB TX 78236-9828

7.0 SUBMISSION OF INVOICES FOR PAYMENT OF THE FIXED FEE FOR EQUIPMENT USE

The contractor shall mail the original invoice on a monthly basis to:

DESC-MI (Invoice Monitor)
Building 1621-K
2261 Hughes Avenue, Ste 128
Lackland AFB TX 78236-9828

Attachment 2

**GUIDELINES FOR THE PREPARATION
OF PRODUCT ANALYSIS REPORTS**

GENERAL INSTRUCTIONS

Jan 2003

These instructions are designed for use as a guide in preparing/formatting product analysis reports for liquid propellants, gases and cryogenic liquids. To facilitate scanning or imaging, only computer generated or typed test reports are acceptable, there should be no handwritten entries. Table I includes the test codes used in this standard report format that will be incorporated into future Electronic Data Interchange (EDI) transmissions of test result data. A template of the standardized test report format is provided in Figure I.

Each report should be tailored to include only those rows of information that are applicable to the specific product being tested and the methods used to evaluate each property. Select only those methods authorized by the product specification unless otherwise stated in the contract. The code used should be limited to the actual test method used for a particular analysis. If a test code does not appear for a specification or contract approved method, contact the Defense Energy Support Center (DESC) at (210) 925-2488.

DETAILED INSTRUCTIONS FOR THE STANDARD TEST REPORT FORMAT (FIGURE 1)

Items appearing in *italics* inside brackets are meant to be short descriptions of the data being requested and should be replaced with the appropriate data.

The test method should be the paragraph cited in the specification for that method or the ASTM procedure cited in the product specification.

Test codes are unique to each test method of each specification or contract clause and must be included on the report.

Table I

Test Codes	Test Description	Spec/Paragraph
1011	Purity	MIL-PRF-27401D, Para 4.4.1
1012	Impurities	MIL-PRF-27401D, Table I, Note d
1013	Water	MIL-PRF-27401D, Para 4.4.2
1014	Total hydrocarbons as methane	MIL-PRF-27401D, Para 4.4.2
1015	Oxygen	MIL-PRF-27401D, Para 4.4.2
1016	Hydrogen	MIL-PRF-27401D, Para 4.4.2
1017	Argon	MIL-PRF-27401D, Para 4.4.2
1018	Carbon Dioxide	MIL-PRF-27401D, Para 4.4.2
1019	Carbon Monoxide	MIL-PRF-27401D, Para 4.4.2

Figure 1

[Name of laboratory performing analysis]
[Address of laboratory performing analysis]
[phone, fax, email of laboratory performing analysis]

Report of Analysis [name of product]

Report Date: [date of certified report]	Report Number: [unique lab report number]
Manufacturer: [name of manufacturer]	Specification: [spec with revision and amendment]
[address of manufacturer]	Product: [name of product]
[address of manufacturer]	Type: [type or grade of product]
Submitted by: [name of submitter]	NSN: [national stock number]
[address of submitter]	Contract: [contract number]
[address of submitter]	Lot: [batch or lot number]
Date Sampled: [sample date]	
Sample Origin: [tank no., drum no., etc.]	
Sample No.: [submitters sample identification]	Reason for submission: [reason for performing analysis]

CODE	METHOD	TEST	UNITS	MIN	MAX	RESULTS
[test code]	[test method]	[test description]	[units]	[spec limits]		[test result]
.
.
.
.
.

Remarks: [include any remarks concerning the analysis]

[Signature of the certifying official]
[Signature block of certifying official]

METRIC

MIL-PRF-27401D
3 October 1995
SUPERSEDING
MIL-P-27401C
20 January 1975

PERFORMANCE SPECIFICATION

PROPELLANT PRESSURIZING AGENT, NITROGEN

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for three grades and two types of nitrogen.

1.2 Classification. The nitrogen shall be of the following types and grades as specified (6.2):

1.2.1 Types. The types of nitrogen are as follows:

Type I - Gaseous

Type II - Liquid

1.2.2 Grades. The grades of nitrogen are as follows:

Grade A - 99.5 percent pure, aerospace practices

Grade B - 99.99 percent pure, space vehicle and cabin environment

Grade C - 99.995 percent pure

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to SA-ALC/SFSP, 1014 Billy Mitchell Blvd/STE 1, Kelly AFB TX 78241-5603, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 9135

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

SP0600-03-R-0315
ATTACHMENT 3

must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

DEPARTMENT OF DEFENSE

- | | |
|-------------|---|
| MIL-S-27626 | - Sampler, Cryogenic Liquid |
| MIL-T-27730 | - Tape, Antiseize,
Tetrafluoroethylene, with Dispenser |

STANDARDS

DEPARTMENT OF DEFENSE

- | | |
|---------|---|
| AN818 | - Nut, Tube Coupling, Short |
| MS20819 | - Sleeve, Flared Tube Fitting |
| MS33584 | - Tubing End, Standard Dimensions for
Flared |

(Unless otherwise indicated, copies of the above specifications, and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia PA 19111-5094).

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|------------|--|
| ASTM E 29 | - Practice for Using Significant Digits in Test Data to
Determine Conformance with Specifications |
| ASTM F 307 | - Practice for Sampling Pressurized Gas for Gas
Analysis |
| ASTM F 310 | - Practice for Sampling Cryogenic Aerospace Fluids |

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia PA 19103-1187.)

COMPRESSED GAS ASSOCIATION (CGA)

- | | |
|------------|--|
| CGA G-10.1 | - Commodity Specification for Nitrogen |
| CGA P-15 | - Filling of Industrial and Medical Nonflammable
Compressed Gas Cylinders |

(Application for copies should be addressed to the Compressed Gas Association, Inc, 1725 Jefferson Davis Highway, Arlington VA 22202-4100.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Grade requirements. The purity and impurity concentrations as applicable to each grade of nitrogen shall conform to the limits of Table I when tested in accordance with the applicable test method also specified in Table I. Other limits and tests may be specified by the procuring activity (see 6.2).

3.2 Limiting values. The following applies to all specified limits in this specification: For purposes of determining conformance with these requirements, an observed value or a calculated value shall be rounded off "to the nearest unit" in the last right-hand digit used in expressing the specification limit according to the rounding-off method of ASTM Practice E 29 for using Significant Digits in Test Data to Determine Conformance with Specifications.

3.3 Filter.

3.3.1 Containers. A filter with no more than a 10-micrometer nominal and 40-micrometer absolute rating shall be installed between the manufacturer's plant system and the manifold used to fill the gas or liquid containers for delivery.

3.3.2 Pipelines. A filter with no more than a 3.5-micrometer nominal and 12-micrometer absolute rating shall be installed downstream of compressors and/or converters and as close to the user's interface as possible for delivery into pipelines. The filter shall remove all particles greater than 100 micrometers in any dimension.

3.4 Filled containers (Type I only).

3.4.1 Pressure. Cylinders and tubes shall be within 99 to 100 percent of rated service pressure when tested as specified in 4.5.1 Pressure-Temperature Filling Charts in CGA P-15 may be used.

3.4.2 Leakage. Cylinders shall not leak when tested according to 4.5.2.

4. VERIFICATION

4.1 Points of inspection (6.2).

4.1.1 Containers. Unless otherwise specified, acceptance tests shall be conducted at the site of filling prior to shipment or departure.

4.1.2 Pipeline. When Type I nitrogen is delivered in pipeline, acceptance tests shall be conducted immediately prior to entering the user's system.

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TABLE I. Grade limits for nitrogen

	Grade			Test Method
	A	B	C	
Purity ^{a,e} , % by vol, min	99.5	99.99	99.995	4.4.1
Impurities, ppm by volume, max	5000	100	50	d
Water	26.3	11.5	5.7	4.4.2
Total hydrocarbons as methane	58.3	5.0	5.0	4.4.2
Oxygen	5000	50	20	4.4.2
Hydrogen	b	b	0.5	4.4.2
Argon ^f	b	20	2	4.4.2
Carbon dioxide ^f	b	5	5	4.4.2
Carbon monoxide ^f	b	5	5	4.4.2
Particulate ^{c,g} , mg/L, max	1.0	1.0	1.0	4.4.3
a. Percent nitrogen includes trace quantities of neon, helium, and small amounts of argon. b. No limit for this grade. c. Applies only to Type II (Liquid) nitrogen. d. Sum of all percentages of water, hydrocarbons, oxygen, and, if applicable, hydrogen, carbon monoxide, carbon dioxide, and argon. e. If direct method is required, use the alternate method 6.3. f. If required by contract. g. The particulate limit may be removed by the procuring activity (6.2).				

4.2 Conformance inspection. Quality conformance tests shall consist of the following:

- a. Individual tests (Type I only) 4.2.1
- b. Sampling tests 4.2.2

4.2.1 Individual tests (Type I only). Each container (cylinder or tube) shall be subjected to the following tests as described under 4.5:

- a. Filling pressure 4.5.1
- b. Leakage 4.5.2

4.2.2 Sampling test. The number of nitrogen containers shall be selected in accordance with Table II and subjected to the tests required by Table I.

TABLE II. Sampling for test

Number of containers in lot	Number of containers to be sampled
1	1
2 - 40	2
41 - 70	3
71 - over	4

4.2.3 Lot. A lot shall consist of one of the following:

a. The nitrogen produced in not more than 24 consecutive hours from a continuous process which is used to fill shipping containers directly from the process output. A continuous process shall be the production of product by continuous input of raw materials and output of finished product by one manufacturer in one plant with no change in manufacturing conditions or materials.

b. The nitrogen from individual runs of a batch process which is used to fill shipping containers directly from the process output. A batch process shall be the production of product by runs from single additions of raw materials which are reacted and purified forming the product.

c. The nitrogen from either or both the continuous and batch processes which is held in a single storage tank and subsequently withdrawn to fill shipping containers. The product shall be homogeneous at the time of withdrawal and shall not be added to while being withdrawn. After each addition to the storage tank, the contents shall constitute a separate lot.

4.2.4 Sample. Each sample shall be of sufficient size to conduct all the quality conformance tests as specified herein. Unless otherwise specified, the quality conformance tests shall be made of each required sample (6.2). When required, an equivalent sample shall be forwarded to a laboratory designated by the procuring activity for testing.

4.2.4.1 Samplers. The sampler for Type I (gaseous) nitrogen shall be a small compressed gas cylinder. The sampler for Type II (liquid) nitrogen shall be in accordance with MIL-S-27626 or functionally equivalent thereto. The liquid samplers convert the entrapped liquid to gas. The aliquots taken for analysis are representative samples.

4.2.4.2 Sampling methods. Unless otherwise specified (6.2), Type I (gaseous) nitrogen shall be sampled in accordance with ASTM F 307 and Type II (liquid) nitrogen shall be sampled in accordance with ASTM F 310 except for the following changes: Replace paragraph 5.1 with "5.1 Ensure that the outlet of the sampling port is clean." Replace paragraph 6.1 with "6.1 Ensure that the outlet of the sampling port is clean."

4.2.5 Cylinders. The number of cylinders (high pressure and cryogenic types) filled with Type I (gaseous) or Type II (liquid) nitrogen selected for sampling from each lot shall be in accordance with Table II. The first and last cylinders to be filled within a given lot shall be sampled. Other samples may be selected at random. The nitrogen from each cylinder sampled shall constitute a separate sample. For the purpose of selecting sample cylinders only, any one cylinder may be selected from a group of cylinders filled simultaneously from a single manifold.

4.2.6 Bulk transports. A sample shall be taken from each portable tank, cargo tank, or tank car filled with Type I (gaseous) or Type II (liquid) nitrogen.

4.2.6.1 Continuous service (6.6.1). Unless otherwise specified by the procuring activity, the following sample option for nitrogen shall be used for storage and transport tanks engaged in continuous nitrogen service (6.2). Contractor shall sample the contents of each transport tank engaged in continuous nitrogen service at least once every seven days at uniform intervals of time. Samples shall be taken from the filled transport tanks. Contractor shall sample the contents of each transport tank when entering continuous service and when the transport tank has remained empty for a period greater than 24 hours. When empty, all ports and vents shall remain closed to the atmosphere. While in continuous service, compliance with quality conformance tests specified herein shall be determined by sampling the filling point storage tank after each addition or, in case of continuous production, at established intervals not less frequent than once every 24 hours. When a storage tank is being filled during a change of duty shift, sampling shall be performed after filling.

4.2.7 Pipelines. Unless otherwise specified in the contract, the following sampling plan shall be used for pipelines: Sampling to determine specification compliance shall be accomplished by drawing liquid phase samples from each filled container transporting liquid for conversion to gas and by drawing samples from the gas supplied into the user's system (6.2).

4.2.7.1 Liquid phase samples. liquid phase samples shall be tested for each parameter in applicable grade of Type II nitrogen. Sampling under the "continuous service" provisions can be applied.

4.2.7.2 Gas phase samples.

a. Samples shall be tested for each parameter in the applicable grade of Type I nitrogen. Samples shall be drawn in accordance with 4.2.4 from a point immediately prior to entering the user's system. The frequency of sampling shall not be less than once every seven days at regular intervals.

b. When specified in contract, in-line samples shall be drawn and tested with continuous monitors for each parameter specified in contract for the applicable grade of Type I nitrogen. Each analyzer shall be equipped with a permanent recording device. When specified in contract, an alarm system to indicate contaminant contents in excess of specified maximum shall be provided (6.2).

c. After internal exposure of the pipeline to the atmosphere or other foreign materials, a sample of gas shall be taken from the pipeline prior to delivery into the user's system at a point between the final filter and the

interface with the Government system. The sample shall be tested for each parameter in applicable grade of Type I nitrogen. After cleaning operation, the sample shall be tested also for contamination by vapors from the cleaning materials.

4.2.8 Other containers (6.2). Unless otherwise specified, other containers of 400 liters or less water capacity shall be sampled in accordance with 4.2.5. Containers greater than 400 liters water capacity shall be sampled in accordance with 4.2.6.

4.3 Rejection. When any sample tested in accordance with 4.4 fails to conform to the requirements specified herein, the entire lot represented by the sample shall be rejected. Unless otherwise specified, disposition of rejected product shall be specified by the procuring activity (6.2).

4.4 Analytical procedures. Unless otherwise specified, samples shall be analyzed according to the procedures described below (6.2). Calibration gas standards may be required to calibrate (zero and span) analytical instruments used to determine the purity and impurity contents of the nitrogen. The accuracy of the calibration gas standards is to be traceable to the National Institute of Standards and Technology.

4.4.1 Nitrogen content. The nitrogen content in percent shall be found by determining the aggregate impurities by the methods described in succeeding sections. The percent nitrogen is the value obtained when this amount, expressed as volume percent is subtracted from 100.

4.4.2 Gaseous contaminants. Methods shall be selected from those of CGA G-10.1.

4.4.3 Particulate content. A filter holder assembly, (Gelman part No 4250X), or equivalent modified as shown on Figure 1 shall be attached to the withdrawal line of the vessel to be utilized to fill the tanks. A preweighed filter paper (Gelman 47 mm glass fiber paper, type A/E or equivalent) shall be placed on top of another filter of the same kind. The filters shall then be placed on the porous filter support, which, in turn, shall be placed in the filter holder as shown in Figure 1. The male threads of the filter holder shall be wrapped with thin, nonadhesive-backed polytetrafluoroethylene tape MIL-T-27730 to prevent galling of the threads. The holder shall be tightened by hand as tight as possible to prevent bypassing of the filter element. The discharge liquid from the filter housing shall be collected in a clean, uninsulated, ambient temperature vessel marked to indicate when 5 liters of liquid have been collected. The liquid flow shall be terminated when 5 liters of liquid have been collected. The filter holder shall be removed from the line and permitted to reach ambient temperature. The warmup to ambient temperature may be expedited by use of an oven or other heat source. Care shall be exercised to ensure that any airflow which enters the unit will be directed through the inlet of the assembly to prevent displacing any particles from the surface of the filter. Upon warmup, the other side of the holder shall be wiped with a clean cloth and the holder then disassembled. The filter paper shall be closely inspected. The test shall be repeated if evidence of either (a) the filter not being securely clamped by uniform depression of its edge; (b) the filter having been cut by the holder; or (c) when dirt particles are detected in the clamped area indicating bypassing had been encountered. The test shall also be repeated when either the bottom filter shows any discoloration or when leakage of liquid from the filter

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holder is detected. Upon completion of a valid test the filter shall be removed from the housing and weighed to the nearest 0.1 mg.

4.5 Containers of Type I nitrogen.

4.5.1 Filling pressure. Samples shall be tested for proper filling pressure by attaching a calibrated Bourdon-tube gauge or equivalent to the valve outlet and by attaching either a thermocouple or thermometer to the container wall. The gauge shall have scale divisions not greater than 100 kPa (15 psi). If a thermometer is used, tape or putty shall be applied to the bulb to protect it from extraneous temperatures. Putty shall not be applied between the bulb and the cylinder wall. The thermometer shall have scale divisions not greater than 1°C (2°F). The containers shall be stabilized to ambient temperature. Then the valve shall be opened and the internal pressure observed on the gauge. If the internal pressure differs from the applicable pressure value by more than 100 kPa, the sample cylinder or tube bank trailer and all other cylinders or tube bank trailers filled from the same manifold at the same time shall be rejected.

4.5.2 Leakage. Each Type I nitrogen container shall be tested for leaks at the neck threads, stem packing, and safety device of the valve with leak-detection fluid. Valve seat leakage shall be tested after filling has been completed. This shall be done by applying the leak-detection fluid sparingly across the outlet of the valve. Only leak-detection fluid that leaves no residue shall be used on the outlet.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Intended use. The nitrogen covered by this specification is intended as a purging and pressurizing medium for rocket propellant systems, space vehicles and support equipment and for preparing oxygen-nitrogen mixtures for breathing purposes on board space vehicles.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. Type and grade of nitrogen required (see 1.2).

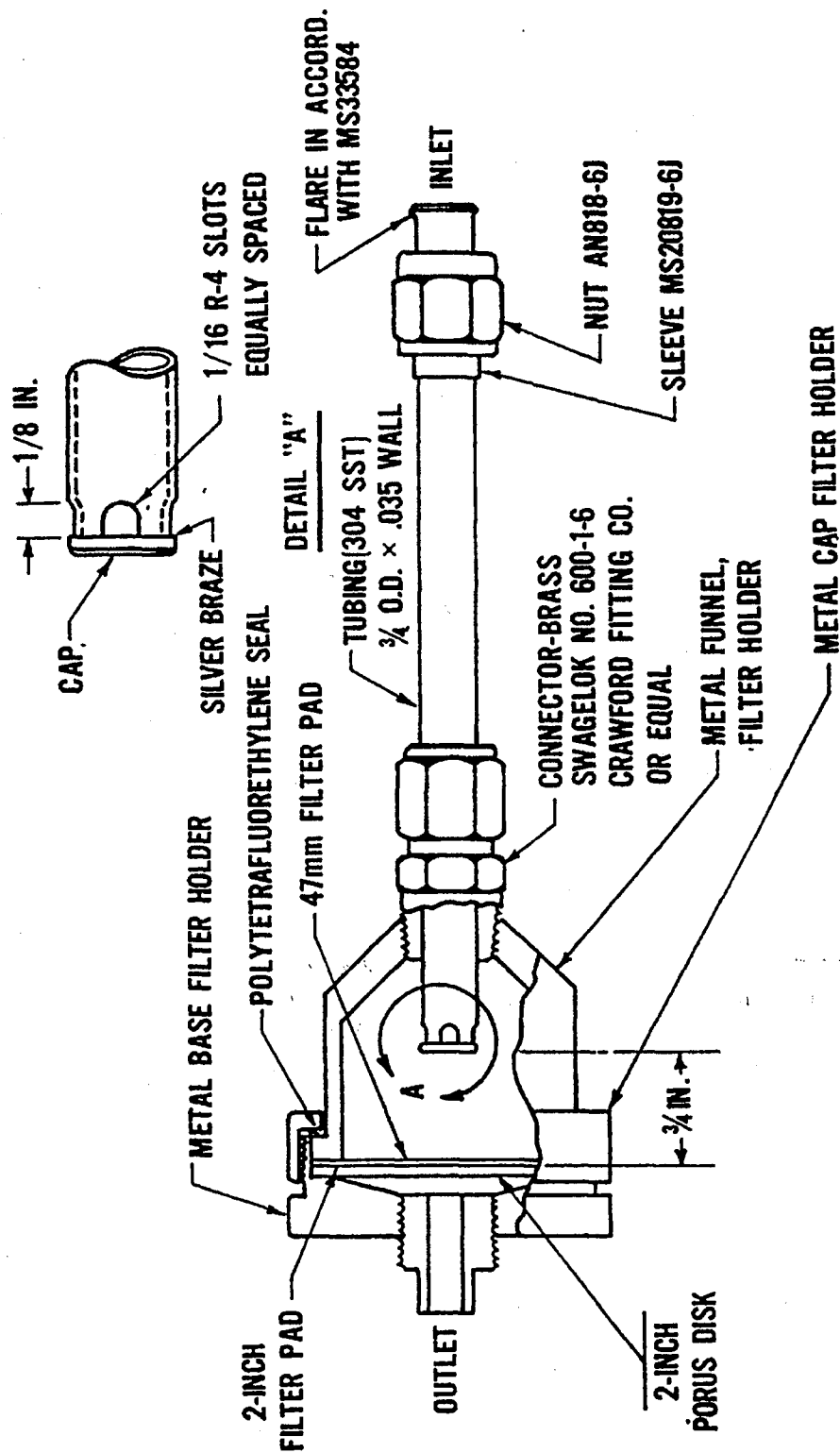


FIGURE 1. Filter, Cryogenic Liquids

MIL-PRF-27401D

- c. Issue of DoDISS to be cited in the solicitation, and, if required, the specific issue of individual documents referenced (see 2.2.1 and 2.3).
- d. When other limits or tests are required (see 3.1).
- e. When testing for argon or carbon dioxide is required (see Table I).
- f. When the particulate test is not required (see Table I).
- g. When a variation in the points of inspection is required (see 4.1).
- h. When a variation of the quality conformance tests to be performed on a sample is required (see 4.2.4).
 - i. When a variation to the sampling method is required (see 4.2.4.2).
 - j. When a variation to the continuous service option is required (see 4.2.6.1).
 - k. When a variation to the sampling plan for pipelines is required (see 4.2.7).
 - l. When an alarm system to warn of contaminants in pipelines is required (see 4.2.7.2,b).
 - m. When a variation to the 400 liter criteria for sampling is required (see 4.2.8).
 - n. When a variation to the disposition of rejected product is required (4.3).
 - o. When a variation of the analytical procedures is required (see 4.4).
 - p. Packaging requirements (see 5.1 and 6.4).
 - q. When color coding of pipeline is required (see 6.4,c).

6.3 Direct nitrogen method. When required either of two methods shall be used to determine the nitrogen content directly: (1) The gas chromatographic method which uses a 5A molecular sieve column and measures the peak height versus retention time. (2) The mass spectrometric method which measures nitrogen at an atomic mass unit (amu) of 28. Carbon monoxide also has an amu of 28 but it can be determined by other methods.

6.4 Packaging requirements. Guidance for cylinders may be found in the following documents:

- a. RR-C-901 - Cylinder, Compressed Gas, High Pressure, Steel DOT 3AA, and Aluminum Applications, General Specification For
- b. MIL-V-2/11 - Valve, Cylinder, Gas, Argon, Helium, Nitrogen, Neon and Xenon, (Inert-Oil Free), Outlet 581
- c. MIL-STD-101 - Color Code for Pipelines and for Compressed Gas Cylinders

- e. 49 CFR 171 - 199 - Code of Federal Regulations

6.5 Part or identifying number (PIN). The PINs to be used for nitrogen acquired to this specification are created as follows:

M 27401 - X X Example of PIN: M27401-2B

Grade (see 1.2.2).

Type (see 1.2.1). Use 1 for Type I; 2 for Type II.

Specification number.

Prefix for military specification.

6.6 Definition.

6.6.1 Continuous service. Continuous service applies to continuous deliveries under Government contract of nitrogen complying with the quality conformance tests specified herein.

6.7 Subject term (key word listing).

Aerospace
Cryogenic
Cylinders
Nitrogen
Pipeline
Propellant
Space vehicle

6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Custodians
Army - MI
Navy - AS
Air Force - 68

Review Activities
Air Force - 19

Preparing Activity
Air Force - 68

Civil Agency Interest
NASA

(Project 9135-0133)

CONTRACTOR PERFORMANCE DATA SHEET

Please submit the requested information for government and non-government contracts or subcontracts held (not to exceed ____ years since completion) for contracts that are similar to the requirements of this solicitation. Those contracts and/or subcontracts submitted may include those still in progress, however they should have a minimum of one year's performance history.

☐ Please mark this box if you have not performed under contracts that are similar in nature to the solicitation requirements.

REFERENCES:

COMPANY NAME	POINT OF CONTACT	PHONE NUMBER	FAX NUMBER	PRODUCT SUPPLIED	QUANTITY	METHOD OF DELIVERY	PLACE OF PERFORMANCE	PERIOD OF PERFORMANCE	SUBCONTRACTING PLAN (YES OR NO)

INDIVIDUAL SMALL BUSINESS SUBCONTRACTING PLAN

OFFEROR:

(* Continue on separate sheets if necessary.)

Solicitation No: SP0600-

NOTE: If a plant or division-wide Master Plan is being incorporated by reference, place 'X' in box and complete Part I (A thru I) and Part IV only.

Date of Plan:

(Copy of Master Plan and evidence of approval by the Government Contract Administration Office are required.)

PART I - SUBCONTRACTING GOALS:

- A. Total dollars planned to be subcontracted: \$
- B. Total dollars planned to be subcontracted to small business concerns: \$
- C. Total dollars planned to be subcontracted to veteran-owned small business concerns: \$
- D. Total dollars planned to be subcontracted to HUBZone small business concerns: \$
- E. Total dollars planned to be subcontracted to small disadvantaged business concerns: \$
- F. Total dollars planned to be subcontracted to women-owned small business concerns: \$
- G. Percentage of total subcontracting dollars for the use of small businesses: %
- H. Percentage of total subcontracting dollars for the use of veteran-owned small businesses: %
- I. Percentage of total subcontracting dollars for the use of HUBZone small businesses: %
- J. Percentage of total subcontracting dollars for the use of small disadvantaged businesses: %
- K. Percentage of total subcontracting dollars for the use of women-owned small businesses: %

L Principle types of supplies and services to be subcontracted

(Indicate types of supplies & services planned for subcontracting to each subcategory of small business

(1) Small business (2) Veteran-owned small business (3) HUBZone small business (4) Small disadvantaged business and (5) Women-owned small business concerns.) (*):

M. Describe method used to develop these goals: (e.g. based on procurement history, available resources, etc.) (*)

N. Were indirect costs included in establishing these goals? Yes ☐ No ☐

If Yes, describe the method used to determine proportionate share of indirect costs to be incurred with (1) small business concerns, (2) veteran-owned small business concerns, (3) HUBZone small business concerns, (4) small disadvantaged business concerns, and (5) women-owned small business concerns: (*):

PART II - SUBCONTRACTING PROCEDURES:

A. Name of the individual who will administer the offeror's subcontracting program:
Include a brief description of this individual's duties:

INDIVIDUAL SMALL BUSINESS SUBCONTRACTING PLAN (CONTINUED)

B. Describe methods used to identify potential sources for solicitation purposes (indicate with an "X" those that apply):

- ☐ Existing company source lists
- ☐ SBA Procurement Marketing & Access Network (PRO-Net)
- ☐ SBA list of certified Small Disadvantaged Business Concerns
- ☐ National Minority Purchasing Council Vendor Information Service
- ☐ Dept. of Commerce Research and Information Division of the Minority Business Development Agency
- ☐ Small, veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business associations
- ☐ OTHER

C. Describe methods used to assure that small business, veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts: (*)

PART III. SUBCONTRACTING PLAN MANAGEMENT:

Offeror certifies that the following procedures regarding management of this Subcontracting Plan will be enacted:
(Indicate acknowledgment of compliance by annotating "X" in appropriate blocks.)

- ☐ A. Contractor will assist small business, veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate participation by such concerns.
- ☐ B. Where lists of potential subcontractors are excessively long, Contractor will make a reasonable effort to give all small business, veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns an opportunity to compete over a period of time.
- ☐ C. Contractor will provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make or buy" decisions.
- ☐ D. Contractor will counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.
- ☐ E. Contractor will provide notice to subcontractors concerning penalties and remedies for misrepresentation of of business status as small business, veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business, for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's Subcontracting Plan.
- ☐ F. Contractor will ensure that the clause entitled "Utilization of Small Business Concerns" (Latest Revision), contained in referenced solicitation, will be included in all subcontracts that offer further subcontracting opportunities, and that all large business subcontractors receiving a subcontract in excess of \$500,000
- ☐ G. Contractor will cooperate in any studies or surveys as may be required.
- ☐ H. Contractor will submit periodic reports in order to allow the Government to determine the extent of compliance by the offeror with this Subcontracting Plan.
- ☐ I. Contractor will submit Standard Form 294, Subcontracting Report for Individual Contracts and/or Standard Form 295, Summary Subcontract Report, in accordance with the instructions on the forms, or as provided in agency regulations.
- ☐ J. Contractor will ensure that subcontractors agree to submit Standard Form 294 and 295, as appropriate.

INDIVIDUAL SMALL BUSINESS SUBCONTRACTING PLAN (CONT'D)

PART III SUBCONTRACTING PLAN MANAGEMENT CONTINUED:

- K. Contractor will maintain the following types of records to demonstrate procedures that have been adopted to comply with the requirements and goals in this Plan. The records shall include at least the following on a plant-wide or company-wide basis, unless otherwise indicated:
- ☐ 1. Source lists (e.g., PRO-Net), guides, and other data that identify small, veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business concerns;
 - ☐ 2. Organizations contacted in an attempt to locate sources that are small, veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business concerns;
 - ☐ 3. Records of each subcontract solicitation resulting in an award of more than \$100,000; indicate--
 - a. Whether small business concerns were solicited, and if not, why not;
 - b. Whether veteran-owned small business concerns were solicited, and if not, why not;
 - c. Whether HUBZone small business concerns were solicited, and if not, why not;
 - d. Whether small disadvantaged business concerns were solicited, and if not, why not;
 - e. Whether women-owned small business concerns were solicited, and if not why not; and
 - f. If applicable, the reason why award was not made to a small business concern;
 - ☐ 4. Records of outreach efforts to contact (a) trade associations, (b) business development organizations, and (c) conferences and trade fairs to locate small, veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business sources;
 - ☐ 5. Records of internal guidance and encouragement provided to buyers through (a) workshops, seminars, training, etc., and (b) monitoring performance to evaluate compliance with the program's requirements; and
 - ☐ 6. On a contract-by-contract basis, supporting information for award data submitted by the Contractor to the Government, including the name, address, and business size of each subcontractor.

PART IV

OFFEROR'S SIGNATURE

TYPED Name and Title

Date

PART V DETERMINATION OF ADEQUACY AND REQUEST FOR SMALL BUSINESS SPECIALIST'S REVIEW

- ☐ The plan has been reviewed and determined adequate by the Contracting Officer. Request SBS.

CONTRACTING OFFICER'S SIGNATURE

TYPED Name and Title

Date

- ☐ Approval 2 levels above CO if SDB Goal is less than 5%:

TYPED Name and Title

Date

PART VI SMALL BUSINESS SPECIALIST CONCURRENCE (If nonconcurrence, see attached rationale.)

DESC-DU SMALL BUSINESS SPECIALIST

Date

PART VII CONTRACTING OFFICER'S APPROVAL BASED ON THE CONTRACTING OFFICER'S DETERMINATION OF ADEQUACY AND THE SMALL BUSINESS SPECIALIST'S CONCURRENCE, THE PLAN IS ACCEPTED.

CONTRACTING OFFICER'S SIGNATURE

Date